

REMARKS/ARGUMENTS

The claimed invention relates to a water-emulsifiable isocyanate composition. In particular, as recited in amended claim 1, the composition comprises the following:

(A) an isocyanurate and/or biuret of 1,6-diisocyanatohexane (HDI),

(B) an isocyanurate of 1-isocyanato-3,5,5-trimethyl-5-isocyanatomethylcyclohexane (IPDI),

(C) at least one emulsifier, and

(D) optionally a solvent,

wherein the at least one emulsifier is obtained by the reaction of at least part of the isocyanurate and/or biuret of HDI, and/or the isocyanurate of IPDI with at least one component (C1), wherein the component (C1) comprises at least one isocyanate-reactive group and at least one hydrophilic group.

The present inventors have found that the components of the above composition “prove readily emulsifiable, lead to a fine, stable emulsion, and can be useful to give coatings which exhibit a rapid increase in hardness and a high ultimate hardness.” (Present specification at page 3, lines 36-39).

The rejection of claims 1-2 and 8-15 under 35 U.S.C. § 102(b) as anticipated by U.S. 5,856,420 to Tucker et al. is respectfully traversed.

The reference does not describe or suggest a *water-emulsifiable* isocyanate composition, in which the composition contains at least one *emulsifier* that is the reaction of at least part of an isocyanurate and/or biuret of HDI, and/or an isocyanurate of IPDI with at the least one component (C1) presently claimed.

The Tucker et al. reference generally describes a two-component composition based on a bis(imine), derived from 1,4-diaminobutane and isobutyraldehyde, and HDI isocyanurate or biuret polyisocyanate. According to the reference, the “bis(imine) is completely miscible in HDI isocyanurate and biuret polyisocyanates, and, as a reactive

diluent, allows the preparation of coatings formulations that require only small amounts of solvents.” (Column 1, lines 9-13). In particular, the “reactive diluents” are “employed to replace some or most of the solvent that is otherwise needed to reduce the viscosity of a coating formulation to a desired low viscosity, thereby reducing the quantity of VOCs emitted by the system.” (Column 1, lines 60-64; see also column 4, lines 22-28). The references also discloses, in another embodiment, a coating composition that contains the bis(imine), the polyisocyanate, and a polyhydroxy compound (e.g., polyhydroxypolyethers). (Column 2, line 54 through column 3, line 5; see also column 6, lines 19-31).

However, the reference does not disclose or suggest that at least part of the polyhydroxy compound is reacted with the polyisocyanate in the composition to form an emulsifier, or even that a water-emulsifiable isocyanate composition is an object of the disclosure. In fact, it appears that the disclosed polyhydroxy compounds are actually binder resins conventionally used in polyurethane coating systems. In particular, the reference recites that the coating systems

are based upon hydroxyl functional resins which are **polymers** that have at least an average of **two hydroxyl groups attached to each polymer chain**. These polymers may contain acrylic, polyester, alkyd/acrylic, **polyether** or other constituent materials known to the art.

(Column 6, lines 5-10). (Emphasis added). These hydroxyl functional resins, e.g., polyhydroxypolyethers, are optionally mixed with bis(imine) and polyisocyanate, in which a two-component polyurethane coating composition is made. (Column 6, lines 19-31).

By contrast, as demonstrated by the present claims, the object of the claimed invention is not to employ a bis(imine) reactive diluent in a coating system, Moreover, the isocyanate-reactive/ hydrophilic component (C1) is clearly not a binder.

The object of the claimed invention is to achieve a *water-emulsifiable isocyanate* composition, which contains (A) an isocyanurate and/or biuret of 1,6-diisocyanatohexane

(HDI), (B) an isocyanurate of 1-isocyanato-3,5,5-trimethyl-5-isocyanatomethylcyclohexane (IPDI), and (C) at least one *emulsifier*, in which the at least one *emulsifier* is obtained by the reaction of at least part of the isocyanurate and/or biuret of HDI, and/or the isocyanurate of IPDI with at least one component (C1), and in which the component (C1) comprises at least one isocyanate-reactive group and at least one hydrophilic group.

In particular, the component (C1) is a “hydrophile” (as explained at page 5, lines 4-26 of the present specification), such that the claimed composition “may be dispersed preferably in water for the purpose of preparing aqueous dispersion; with particular preference, the [composition is] mixed into aqueous dispersions.” (Present specification at page 12, lines 30-33). Applicants note that “[e]mulsifiability in water is brought about by blending the polyisocyanate with emulsifiers which are obtained by reacting the polyisocyanates with hydrophilic molecules.” (Present specification at page 1, lines 11-14). Moreover, as discussed above, the claimed composition “lead[s] to a fine, stable emulsion,” which is used to achieve coatings that “exhibit rapid increase in hardness and a high ultimate hardness.” (Present specification at page 3, lines 36-39).

As the Tucker et al. reference does not describe a water-emulsifiable isocyanate composition or the use of emulsifiers whatsoever, the claimed invention does not anticipate the reference. Further, the claimed invention would not be obvious in view of the reference, since there is no evidence or suggestion in the disclosure of any water-based emulsions or water-borne coating technology that would employ the claimed composition.

Therefore, in view of the foregoing reasons, Applicants submit that the rejection under 35 U.S.C. § 102(b) should be withdrawn.

The rejections of claims 1-15 under 35 U.S.C. § 103(a) as obvious over WO 01/38415 to Huynh-ba, and Huyn-ba in view of U.S. Patent No. 5,387,367 to Haeberle et al. and U.S. Patent No. 6,426,414 to Laas et al.

Huynh-ba does not describe or suggest the *water-emulsifiable* isocyanate composition.

The reference generally describes a low VOC solvent-based polyurethane coating composition, “containing a film-forming **binder** and a **volatile organic liquid carrier** for the binder, wherein the **binder** contains (A) a hydroxyl component comprising at least one hydroxyl containing acrylic polymer and at least one hydroxyl-terminated polyester oligomer; and (B) a polyisocyanate component, at least a portion of which comprises a trimer of isophorone diisocyanate” (Page 2, lines 24-35 of the reference) (Emphasis added). There is no suggestion whatsoever that any of the components are combined to form an *emulsifier* or even that the formation of any water emulsion is achieved by any composition in the reference. In fact, as shown in each of the four examples in the reference, the components are only used as *binder* materials in non-aqueous clear coat compositions, and not reacted in any way to form emulsifiers. Therefore, the claimed invention is not obvious in view of the Huynh-ba reference, as a binder and an emulsifier are different technologies.

The references to Haeberle et al. and Laas et al. do not cure the deficiencies of Huyn-ba.

Regarding Haeberle et al., the reference merely discloses that non-aqueous polyisocyanate formulations may be used in *aqueous* formulations, but there is no evidence or suggestion whatsoever that such formulations would be stable or even useful for the solvent-borne technology disclosed in the Huynh-ba reference. In particular, as discussed above, the coating composition of the Huynh-ba reference mainly includes a *volatile organic liquid carrier* with the binder resin, which is emphasized throughout the reference and the examples.

Similarly, the Laas et al. reference generally discloses *water-dispersible* polyisocyanate mixtures prepared from various types of isocyanates. However, there is no

Application No. 10/522,715  
Reply to Office Action of August 26, 2005

suggestion or evidence that one would selectively choose such a mixture or that such a mixture would be stable in the completely different technology that disclosed in the Huynh-ba reference.

Therefore, in view of the foregoing reasons, Applicants submit that the rejections under 35 U.S.C. § 103(a) should be withdrawn.

Applicants submit the application is now in condition for allowance. Early notification of such allowance is earnestly solicited.

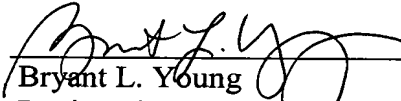
Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)

  
Bryant L. Young  
Registration No. 49,073